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## MR. HIGGS' MONOCHORD.

THE monochord is an oblong, rectangular box, made of mahogany, 26 inches long,  $2\frac{1}{4}$  inches wide, and  $2\frac{1}{8}$  inches high. On the upper surface are marked the diatonic and chromatic scales; a single wire is extended lengthwise over a bridge at either end of the instrument, and the different notes are produced by moving a third bridge along the top of the instrument with the right hand, while the wire is touched with one finger of the left hand. Unlike the tuning-fork, which is capable of producing only one tone or note, the monochord produces any of the notes either of the diatonic or any other scale. It also gives a correct idea of vibration and the theory of sound.

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AN ACCOUNT OF MESSRS. CARMICHAEL, FAIRBANKS,  
AND CO.'S AMERICAN EXCAVATING MACHINE.

By W. NEWTON, JUN. Esq.

THE machine is composed of the following parts, viz. first, a strong wooden platform placed upon wheels, in order to be moved along a temporary railway previously constructed for that purpose. Second, a strong crane placed at one end of the platform, to which it is firmly connected at its base. This crane is so constructed that it may be turned round beyond a right angle either to the right or left of the platform. Third, an instrument, which may be termed a shovel, bucket, scraper, excavator, or digging tool, for removing and collecting the earth; this shovel or excavator, being suspended from the jib of the crane, is raised or lowered at pleasure, by means of chains which are in connexion with the steam-engine by which the machinery is actuated. Fourth, an arrangement of wheelwork communicating with the steam-engine, which is fixed on the platform, and put in motion thereby, and by means of which wheelwork or gearing the attendants who work the machine may direct its movements with the greatest precision. The motion of the platform is also effected by the same engine.

The bucket or excavator will hold about  $1\frac{1}{2}$  cubic yards of earth, the lower side is rounded and indented with a series of sharp steel points, similar to those of a ploughshare, the sides and upper part being square. This bucket is hung by the middle upon braces fastened to a stout wooden arm of any required length, which is rigged out or drawn in by chains connected with the steam-engine machinery. The depth to which the bucket is thrust is regulated